

CLAIMS

1. Inner ear stimulation prosthesis including excitation means (11) designed to generate vibrations capable of  
5 exciting a patient's ear, characterized in that it comprises an implantable portion (1, 1a to 1g), including a rod (2, 2a, 2c, 2f) capable of transmitting vibrations and that is designed so as to be capable of transmitting vibrations generated by the excitation means (11) directly  
10 to the patient's inner ear.

2. Prosthesis according to claim 1, characterized in that the rod (2, 2a, 2c, 2f) is designed to be placed in contact with a semicircular canal of the patient's inner ear.  
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3. Prosthesis according to claim 1 or 2, characterized in that the rod (2, 2a, 2c, 2f) is designed to be placed in contact with the external semicircular canal of the patient's inner ear.  
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4. Prosthesis according to claim 1 or 3, characterized in that the rod (2, 2a, 2c, 2f) is made of a hard and rigid biocompatible material selected from metals, plastic materials and ceramic materials.  
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5. Prosthesis according to one of claims 1 to 4, characterized in that the rod (2, 2a, 2f) has a cross-section with a flattened shape.

6. Prosthesis according to one of claims 1 to 5, characterized in that the rod (2, 2a, 2f) comprises at least one elbow (4) so as to be capable of connecting an external portion of the patient's skull to the inner ear  
5 without requiring complex surgery involving total anesthesia of the patient.

7. Prosthesis according to claim 6, characterized in that the rod (2, 2a, 2f) has a length between the elbow (4) and  
10 its end in contact with a portion of the patient's inner ear, between 20 and 30 mm and has an elbow angle between its two end portions of between  $70^{\circ}$  and  $130^{\circ}$ .

8. Prosthesis according to one of claims 1 to 7,  
15 characterized in that the surface of the implantable portion (1) is treated so as to prevent any osseointegration.

9. Prosthesis according to one of claims 1 to 8,  
20 characterized in that the rod (2a) is pivotably mounted on a support (7, 7').

10. Prosthesis according to one of claims 1 to 9,  
characterized in that the excitation means (11) are  
25 arranged in an external casing (10, 10', 10a) and are designed so as to generate vibrations intended to be transmitted through the patient's skin to a plate (3) rigidly connected to the rod (2, 2a).

11. Prosthesis according to claim 10, characterized in that the plate (3) has a substantially rectangular shape with foam edges of which the length is between 6 mm and 20 mm and the width is between 3 mm and 10 mm.

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12. Prosthesis according to claim 10 or 11, characterized in that the external casing (10, 10', 10a) is integrated in an object capable of being held on the patient's head so that the excitation means (11) are arranged opposite the  
10 plate (3) of the implantable portion (1).

13. Prosthesis according to claim 12, characterized in that the object capable of being held on the patient's head is selected from either a pair of eyeglasses or a casing that  
15 fits around the ear.

14. Prosthesis according to one of claims 10 to 12, characterized in that the external casing (10a) includes at least one magnetic part (18) intended to cooperate with at  
20 least one magnetic part (8) provided in the implantable portion (1a, 1b) so as to hold the excitation means opposite the plate (3).

15. Prosthesis according to one of claims 1 to 8,  
25 characterized in that the excitation means (11) are integrated in the implantable portion (1c, 1d, 1e) and coupled directly with the rod (2c).

16. Prosthesis according to one of claims 1 to 8,  
30 characterized in that the rod (2f) is rigidly connected to

attachment means (41, 45, 46) for attaching the rod to the patient's skull bone.

17. Prosthesis according to claim 16, characterized in that  
5 the excitation means (11) are housed in an external casing (50, 50') equipped with coupling means (51), so as to be removably attached through the patient's skin to attachment means (41, 41') intended to be attached to the patient's skull bone.

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18. Prosthesis according to claim 17, characterized in that the external casing (50, 50') containing a microphone (14) is intended to be attached on the side of a totally defective ear of the patient, while the rod (2f) is  
15 intended to be attached so as to excite the other, non-defective, ear of the patient, with the vibrations generated by the excitation means being transmitted to the rod by bone conduction of the patient's skull bone.

20 19. Hearing aid, characterized in that it is consistent with one of claims 1 to 18.

20. Prosthesis for neurostimulation against tinnitus, characterized in that it is consistent with one of claims 1  
25 to 19.

21. Prosthesis for neurostimulation against balance disorders, characterized in that it is consistent with one of claims 1 to 20.

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22. Implantable prosthesis portion, characterized in that it is consistent with one of the previous claims.